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Case report

A case of abdominal pregnancy following *in vitro* fertilization and embryo transfer treated with laparoscopic surgery

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ABSTRACT

It is well known that the incidence of ectopic pregnancy has increased significantly with the prevalence of assisted reproductive technologies such as *in vitro* fertilization and embryo transfer (IVF-ET). Almost all ectopic pregnancies following IVF-ET are actually tubal pregnancies just like ectopic pregnancy following natural conception. Abdominal pregnancy is a rare form of ectopic pregnancy (< 1% of all ectopic pregnancies) and therefore abdominal pregnancy following IVF-ET is very rare. Recently, we experienced a case of abdominal pregnancy following IVF-ET treated with laparoscopic surgery at 10 weeks' gestation. The possibility of an ectopic pregnancy including abdominal and heterotopic pregnancies should be considered in any pregnant woman following IVF-ET. A diagnostic laparoscopy is a very suitable procedure for looking into the abdominal cavity in case of such a rare ectopic pregnancy.

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Introduction

Recently, the incidence of ectopic pregnancy has increased significantly because of the prevalence of assisted reproductive technologies and the spread of sexually transmitted diseases.[1] However, almost all ectopic pregnancies following *in vitro* fertilization and embryo transfer (IVF-ET) are tubal pregnancies as is the case in natural conception.[2] Abdominal pregnancy is an uncommon type of ectopic pregnancy (< 1% of all ectopic pregnancies) and therefore abdominal pregnancy following IVF-ET is an extremely rare condition.[3] We experienced a case of abdominal pregnancy following IVF-ET treated with laparoscopic surgery at 10 weeks' gestation. We present the clinical course of our case and review the literature concerning ectopic pregnancies following IVF-ET.

Case Report

A healthy 32-year-old woman, gravida 5 para 1, conceived through IVF-ET for male infertility in a private clinic. In particular, her pregnancy was achieved after single frozen-thawed embryo transfer in the hormone replacement cycle. Her pregnancy had been managed just as an early pregnancy loss in her private clinic after pregnancy recognition, but she was referred to our hospital on suspicion of ectopic pregnancy at 10 weeks' gestation due to persistent genital bleeding and continuous detection of maternal urinary human chorionic gonadotrophin (HCG). At the first visit, ultrasound examination demonstrated no gestational sac in the uterus and could not detect apparent adnexal mass or findings suggestive of ectopic pregnancy in the pelvic cavity. Hormonal analysis revealed elevation of maternal serum HCG (14,800 IU/L). Because no decline of maternal serum HCG was observed after curettage of the uterine cavity, her pregnancy was confirmed as an ectopic pregnancy and a diagnostic laparoscopy was performed. During the operation, laparoscopy demonstrated an abdominal pregnancy. A peritoneal implantation of gestational tissue without gestational sac in the right retroperitoneum was recognized (Figure 1A), and the complete removal of the gestational tissue was performed (Figure 1B). The level of maternal serum HCG progressively decreased after the operation and the patient was followed

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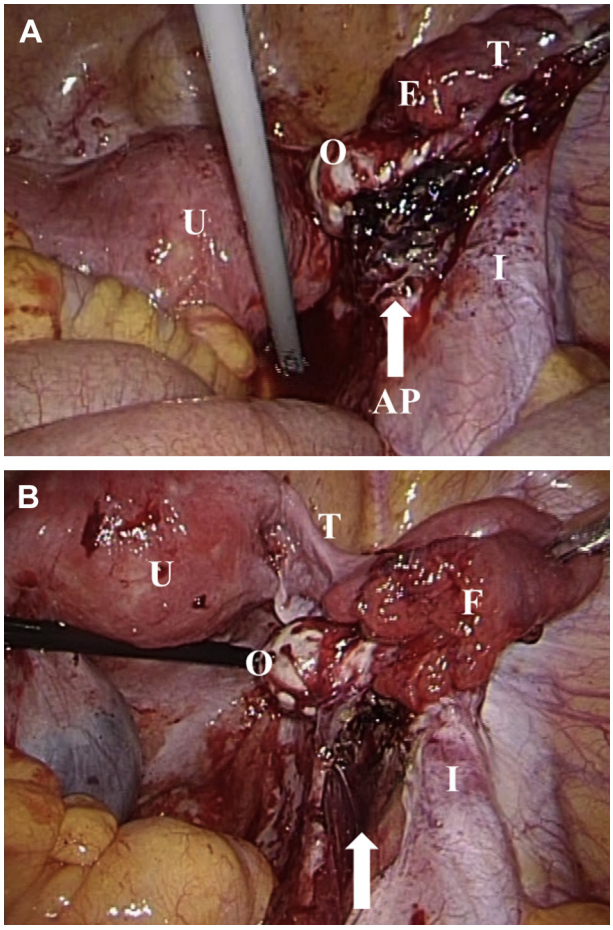

Figure 1. (A) Peritoneal implantation of gestational tissue without gestational sac at right retro-peritoneum was detected during a diagnostic laparoscopy. (B) Removal of gestational tissue was successfully performed by a laparoscopic procedure. White arrow indicates the excision site of abdominal pregnancy. AP = abdominal pregnancy; F = fimbria of fallopian tube; I = infundibulopelvic ligament; O = ovary; T = fallopian tube; U = uterus.

up for 3 months with no evidence of recurrence of ectopic pregnancy.

Discussion

Abdominal pregnancy is defined as an implantation of gestational tissue in the peritoneal cavity with the exception of the fallopian tubes, ovaries, or uterine ligaments.[3] The incidence of this condition is reported to be about one in 25,000 pregnancies. Although an embryo can implant primarily in the peritoneal cavity, most abdominal pregnancies are considered to occur subsequent to early tubal abortion or rupture.[3] As proof of this theory, it is not uncommon for the placenta to remain partially implanted to the adnexa in the case of abdominal pregnancy. The implantation site of our case was the right retroperitoneum just below the fimbria of the right fallopian tube, which indicates the possibility that her ectopic pregnancy was secondary to early tubal abortion. So, the aborted gestational tissue may implant in the peritoneal cavity. Ali and Fitzgerald[4] emphasized the importance of intraoperative cautious care during surgery for ectopic pregnancy and the need for postoperative surveillance of maternal serum HCG for the early detection of the reimplantation of the gestational tissue.[4]

The incidence of ectopic pregnancy following IVF-ET has been reported to be 2.2–4.9%.[2,5] The risk factors for ectopic pregnancy following IVF-ET are divided into two main categories: the effect of fertility treatment (especially ovulation induction) and the shared risk factors with infertility itself (especially tubal infertility).[2] Grady et al[5] reported that even elective single embryo transfer gestation is associated with a higher risk of ectopic pregnancy compared with spontaneous conceived gestation (relative risk: 6.40, 95% confidence interval: 4.38–9.35), which indicates the association between ectopic pregnancy and IVF-ET with the exclusion of the effect of the number of the transplanted embryo. According to a retrospective study by Malak et al[6] investigating a total of 365 patients, it was concluded that tubal factor infertility and previous surgery for endometriosis appear to be risk factors for ectopic pregnancy following IVF-ET. Interestingly, the incidence of ectopic pregnancy following IVF-ET slightly declines (1.9%) when considering intracytoplasmic sperm injection, which is one of the assisted reproductive technology procedures mainly used for male factor infertility.[2] A characteristic type of ectopic pregnancy after IVF-ET is a heterotopic pregnancy (coexistence of intrauterine and ectopic pregnancy), which occurs more often following IVF-ET (1–3%) than following natural conception (about 1 in 30,000 pregnancies).[2,3] Even after the recognition of intrauterine pregnancy, careful observation of the adnexa and pelvic cavity is necessary.

Oehninger et al.[7] reported the first case of abdominal pregnancy after IVF-ET. Subsequently, to our knowledge; only six cases of this rare condition have been reported in the world English literature. Interestingly, three of them were a heterotopic abdominal pregnancy.[8–10] These three abdominal pregnancies ware successfully treated surgically and the concurrent intrauterine pregnancy was preserved in two of the three cases. The possibility of abdominal pregnancy should be kept in mind in the differential diagnosis of acute abdomen in women who have undergone IVF-ET.[9]

In conclusion, we report a case of abdominal pregnancy following IVF-ET treated by laparoscopic surgery at 10 weeks' gestation. The possibility of ectopic pregnancy including abdominal pregnancy and heterotopic pregnancy should be considered in any pregnant woman following IVF-ET. A diagnostic laparoscopy is a very suitable procedure for looking into the abdominal cavity in case of such a rare ectopic pregnancy.

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